

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re patent application of

Docket No.: 294-231 PCT/US

Asim Sarkar

Serial No.: 10/552,916

Group Art Unit: 1796

Confirmation No.: 4536

Filed: 09/18/2006

Examiner: REDDY, KARUNA P.

For: **POLYMERISATION INITIATOR SYSTEM**

**DECLARATION OF ASIM K. SARKAR, Ph.D. UNDER 37 C.F.R. § 1.132**

Relative to the above-identified patent application, I, Asim K. Sarkar, do hereby declare as follows:

1. I am a competent adult.
2. I have personal knowledge of the matters contained herein, and if called as a witness I could and would testify thereto under oath.
3. I have a Ph.D. in Chemistry.
4. I am a named inventor on over two dozen chemical patents, some of which are licensed to German and Japanese chemical companies.
5. I have published several scientific communications and reference monographs.

6. I have over fifty (50) years of professional experience in the chemical field, including: nearly two decades of employment with Hickson & Welch Ltd. from 1951-1970, where I managed R&D for optical brightening agents; eight (8) years of employment with Cyanamid-Europe from 1970-1978, where I managed various chemicals and then directed new product development for the European, Middle East and African markets; over a decade of employment with American Cyanamid Co. from 1979-1991 where I managed commercial and business development for various products, including polymer additives, coatings and resins.
7. I am the founder and President of Temsa International, Inc. ("Temsa"), a Connecticut corporation with a principal address at 5 Franklin Ct, Newtown, CT 064701-468, United States.
8. Temsa manufactures and sells organic industrial chemicals.
9. I am the inventor of the subject matter described and claimed in pending U.S. Patent Application No. 10/552,916.
10. I am intimately familiar with azo initiators, including the production, handling and uses of azo initiators.
11. I consider myself to be an expert in the field of organic industrial chemicals.
12. I have reviewed the U.S. patent application referenced above ("Patent Application") and the response to the non-final office action to which this declaration is being attached.
13. I have reviewed the office action for the Patent Application.

14. The Patent Application describes and claims a polymerisation initiator package comprising a bag having a sealable opening. The bag is comprised of a water soluble polymeric material. A determined amount of a dry powder water soluble azo-initiator is contained inside the bag. A sealing member is comprised of the same water soluble polymeric material as the polymeric bag. The sealing member closes the opening of the bag containing the dry powder water soluble azo-initiator, and said sealing member not causing physico-chemical changes to the water soluble polymeric material comprising the bag.

15. I have been awarded patents in China (No. 100471880) and India (No. 229306) for a polymerization initiator system comprising a water-soluble container and a water-soluble azo-initiator inside the container. The Chinese and Indian patents were based upon the same PCT International Application as the U.S. Patent Application referenced above.

16. The broadest allowed claim of Chinese Patent No. 100471880 recites:

“1. 一种聚合引发剂系统，其包含水溶性容器和所述容器内的水溶性偶氮引发剂，其中所述容器由水溶性聚合物制成。”

which translates to: “A polymerization initiator system, comprising a water-soluble container and a water-soluble azo-initiator inside the container.”

17. The broadest claim of Indian Patent No. 229306 recites: “Polymerisation initiator system, comprising a water-soluble container and a water-soluble azo-initiator inside the container.”

18. I have a pending European patent application, EP20040739087 for the invention. The examiner assigned to my pending European application has recently indicated that the pending claims are novel and inventive. While I still await final approval, neither I nor my European patent agent expect any problems. The broadest claim of my pending European patent

application recites: "Polymerisation initiator system, comprising a water-soluble container and a water-soluble azo-initiator inside the container."

19. I have reviewed all references cited by the examiner and applicant in connection with the Patent Application.

20. The cited references do not disclose, teach or suggest claimed elements of my invention or supply any motivation or rationale to provide a polymerization initiator package as recited in new independent Claim 25.

21. In my opinion, no prior art teaches or enables a polymerization initiator package as recited in new independent Claim 25.

22. From the cited references, no person of ordinary skill in the art would have any reason to provide a polymerization initiator package wherein dry powder azo-initiator is present inside a water soluble bag sealed with a material from which the bag is made; nor would a person of ordinary skill have any reasonable expectation of success that such a system would be suitable for use in aqueous polymerization systems.

23. A person of ordinary skill would have no reason to expect that container and initiator would dissolve quickly enough for a fast initiation of a polymerization reaction, nor that the package according to the invention would be suitable to be used in the preparation of a polymer without substantially contaminating the polymer with the material of which the container is made.

24. Water soluble PVA containers have been known for many decades, as evidenced by Phillips et al. GB-922317A (copy attached).

25. Azo initiators for polymerization have been used for many decades, as evidenced by Robertson, U.S. Patent No. 2520338 (copy attached), having a filing date of June 27, 1947, which discloses carboxyl-containing azonitriles and their salts as initiators.

26. No one previously arrived at my invention recited in Claim 25. Over five decades after Phillips et al. and Robertson, leading to my claimed invention, no one has ever adapted a PVA water-soluble container to safely and efficiently deliver a determined amount of a powder azo-initiator into a medium of aqueous polymerization to produce a water soluble or emulsifiable polymer. Such a long period in a field that is as economically significant and frequently studied as the field of technology to which his claimed invention relates clearly supports a finding of nonobviousness.

27. The claimed invention is contrary to the prior art's teaching. In an effort to address problems associated with toxicity and loss of expensive material, over the decades preceding Applicant's invention, chemists utilized costly granulation equipment and cumbersome processes to form azo-initiator granules. Unfortunately, however, the granules still produce deleterious dust, especially as the integrity of the granules degrades with handling and over time. Furthermore, granulation may compromise the quality of the initiator. Thus, the prior art taught granule formation in an effort to overcome the problems attributed to raw azo-initiator powder.

28. Rather than attempt to improve upon the process of forming granules, I opted for an entirely different approach. My approach involved introducing a new material to an aqueous

polymerization batch, namely, the material comprising the water soluble bag. Developing such an approach required considerable analysis and testing to ensure that the water soluble bag would not adversely impact the contained azo-initiator powder or the polymerization process.

29. The results achieved by the claimed combination are greater than the sum of the separate results of its parts. The combination is synergistic. The result, namely, safe and efficient delivery of a toxic and expensive azo-initiator in its purest form, greatly exceed what a water soluble polymer and a dry powder azo-initiator could provide separately.

30. Temsa produces and sells, under the trade name AZCAT, a polymerization initiator package composed of a water soluble polymeric bag with a sealable opening, a measured amount of a dry powder water soluble azo-initiator contained inside the bag, and a sealing tie comprised of the same water soluble polymeric material as the polymeric bag. The commercially successful product is the claimed invention. Since 2005, Temsa has sold 50 to 100 tons of the claimed initiator package annually. Annual sales revenue greatly exceeds \$1 million. Millions of pounds polymers have been processed using Temsa's AZCAT initiator package.

31. The commercial success is due to the unique functionality and characteristics of the initiator package itself, rather than to other factors such as marketing.

32. The purchasing conditions are driven primarily by functionality of the claimed initiator package, rather than marketing or other factors. The decision to purchase Temsa's initiator package requires careful consideration by knowledgeable, highly trained and extraordinarily careful industrial chemists. It takes, at the very least, several weeks for a customer to receive

samples of the initiator package, test the initiator package in polymerization batches, evaluate the processing and test the resulting product.

33. Customers have favorably expressed to me a strong preference for the dry powder water soluble azo-initiator contained in the safe-to-handle water soluble bag. Customers have also expressed to me a strong preference for the determined amount of azo-initiator. Additionally, Customers have explained that commercially available azo-initiator granules are disfavored due to their cost, tendency to produce deleterious dust, especially as granule integrity degrades with handling and the passage of time, and difficulty to properly meter the correct amount of granules into a polymerization batch.

I, the undersigned declarant, further state that the above statements are made with the knowledge that willful false statements and the like are punishable by fine and/or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that any such willful false statements may jeopardize the validity of this application or any patent resulting therefrom.

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/Asim Sarkar/  
Asim K. Sarkar

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October 18, 2009  
Date